Patent claims

1. Process for the conversion of solar radiation into electric power and heat with one or several colour-selective interference filter reflectors that will split up solar radiation into different wavelength ranges and concentrate it on several photovoltaic cells that are made of semi-conductors and that have been optimised for different light colours, **this process being characterized by the fact** that the light will be separated into at least two spectral wavelength ranges with the help of movable interference reflector films (2), with every film reflecting one wavelength range and transmitting another part.

2. Process in accordance with claim 1 and **characterized by the fact** that the direct solar radiation will be concentrated refractively or reflectively before being split up into two or several wavelength ranges and that one or several movable interference reflector films (2) are located as focal points at one or two levels before the area with the highest light

concentration so that there will always be one focal point for the light fraction which is reflected by the interference reflector film (2) and also one for the light fraction which is transmitted by the interference reflector film (2), while the geometric position of these focal points does not change at all or only insignificantly by the one or two-dimensional movement of the interference reflector films(2).

3. Process in accordance with claims 1 and 2 and **characterized by the fact** that the interference reflector film (2) cannot only be moved by reeling it off spindle (3) and onto spindle (4), but also by shifting the spindles (3 and 4) axially in relation to the zone with the highest light concentration.

4. Process in accordance with claims 1 and 3 and **characterized by the fact** that the interference reflector film (2) is either continuously or discontinuously re-reeled.

5. Appliance of a concentrator solar collector with colour-selective reflectors that is **characterized by the fact** that lenses, preferably Fresnel lenses (1), are installed in a given frame (6) of the solar collector and directed towards the sun light, with a photocell being in the focal point of the lens, and that a movable interference reflector film

(2) has been installed between the lens and the photocell.

6. Appliance in accordance with claim 5 and **characterized by the fact** that the colour-selective interference reflector film (2) is made of a flexible foil, with a section of which being slowly be moved from spindle (3) to spindle (4) through the concentrated solar radiation.

7. Appliance in accordance with claim 5 and **characterized by the fact** that photocells made from such semi-conductor materials with a band gap geared to the relevant wavelength range are located in the area of one or several of these focal points.

8. Appliance in accordance with claim 5 and **characterized by the fact** that always one end of an optical wave guides (9) or transfer piece to such an optical wave guide is located in the area of one or several of these focal points.

9. Appliance in accordance with claim 7 and **characterized by the fact** that the photocells are mounted on heat sinks (7) through which a liquid will be channelled.

10. Appliance in accordance with claim 7 and **characterized by the fact** that the photocells are mounted on heat sinks (7) through which gas

with an operating pressure of > 1 bar will flow.

11. Appliance in accordance with claim 9 or 10 and **characterized by the fact** that a thin-layered system of semi-conductors with a band gap of less than 0.7 eV is located between the photocells and the heat sinks (7).

Summary

The invention concerns a process and an appliance of a concentrator solar collector that are used to split up solar radiation with the help of colour-selective reflectors into several spectral colours and to concentrate this radiation on photovoltaic cells made of semi-conductors that have been optimised for different light colours. The invention is aimed at converting solar radiation into electric power and heat with a high efficiency.